SEQUENCE LISTING

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<120> MORPHOGENIC PROTEIN-SPECIFIC CELL SURFACE RECEPTORS AND USES
THEREFOR

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<141> 2001-10-18

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<151> 1995-06-02

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gaa cat cgg ggc tgc ggg aac ttg cac agg gag ctc tgc agg ggg cgc   240
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Pro Thr Glu Phe Val Asn His Tyr Cys Cys Asp Ser His Leu Cys Asn
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cac aac gtg tcc ctg gtg ctg gag gcc acc caa cct cct tcg gag cag   336
His Asn Val Ser Leu Val Leu Glu Ala Thr Gln Pro Pro Ser Glu Gln
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Leu Leu Ala Leu Val Ala Leu Gly Val Leu Gly Leu Trp His Val Arg
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cgg agg cag gag aag cag cgt ggc ctg cac agc gag ctg gga gag tcc      480
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Ser Leu Ile Leu Lys Ala Ser Glu Gln Gly Asp Thr Met Leu Gly Asp
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ctg gtg cag agg aca gtg gca cgg cag gtt gcc ttg gtg gag tgt gtg      624
Leu Val Gln Arg Thr Val Ala Arg Gln Val Ala Leu Val Glu Cys Val
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cag ggc aaa cca gcc att gcc cac cgc gac ttc aag agc cgc aat gtg     1008
Gln Gly Lys Pro Ala Ile Ala His Arg Asp Phe Lys Ser Arg Asn Val
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ctg gtc aag agc aac ctg cag tgt tgc atc gcc gac ctg ggc ctg gct     1056
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Phe Gly Leu Val Leu Trp Glu Ile Ala Arg Arg Thr Ile Val Asn Gly
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Pro Ser Phe Glu Asp Met Lys Lys Val Val Cys Val Asp Gln Gln Thr
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Thr Cys Thr Cys Glu Ser Pro His Cys Lys Gly Pro Thr Cys Arg Gly
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His Asn Val Ser Leu Val Leu Glu Ala Thr Gln Pro Pro Ser Glu Gln
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Ser Leu Ile Leu Lys Ala Ser Glu Gln Gly Asp Thr Met Leu Gly Asp
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Leu Leu Asp Ser Asp Cys Thr Thr Gly Ser Gly Ser Gly Leu Pro Phe
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Val Met His Ser Gln Gly Ser Asp Tyr Leu Asp Ile Gly Asn Asn Pro
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Ile Arg Thr Asp Cys Phe Glu Ser Tyr Lys Trp Thr Asp Ile Trp Ala
385             390             395             400

Phe Gly Leu Val Leu Trp Glu Ile Ala Arg Arg Thr Ile Val Asn Gly
            405             410             415

Ile Val Glu Asp Tyr Arg Pro Pro Phe Tyr Asp Val Val Pro Asn Asp
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Pro Ser Phe Glu Asp Met Lys Lys Val Val Cys Val Asp Gln Gln Thr
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gtg atg att ctt cct gtg ctt atc atg att gct ctc ccc tcc cct agt      163
Val Met Ile Leu Pro Val Leu Ile Met Ile Ala Leu Pro Ser Pro Ser
5                   10                  15                  20

atg gaa gat gag aag ccc aag gtc aac ccc aaa ctc tac atg tgt gtg      211
Met Glu Asp Glu Lys Pro Lys Val Asn Pro Lys Leu Tyr Met Cys Val
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tgt gaa ggt ctc tcc tgc ggt aat gag gac cac tgt gaa ggc cag cag      259
Cys Glu Gly Leu Ser Cys Gly Asn Glu Asp His Cys Glu Gly Gln Gln
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tgc ttt tcc tca ctg agc atc aac gat ggc ttc cac gtc tac cag aaa      307
Cys Phe Ser Ser Leu Ser Ile Asn Asp Gly Phe His Val Tyr Gln Lys
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ggc tgc ttc cag gtt tat gag cag gga aag atg acc tgt aag acc ccg      355
Gly Cys Phe Gln Val Tyr Glu Gln Gly Lys Met Thr Cys Lys Thr Pro
    70                  75                  80

ccg tcc cct ggc caa gct gtg gag tgc tgc caa ggg gac tgg tgt aac      403
Pro Ser Pro Gly Gln Ala Val Glu Cys Cys Gln Gly Asp Trp Cys Asn
85                  90                  95                  100

agg aac atc acg gcc cag ctg ccc act aaa gga aaa tcc ttc cct gga      451
Arg Asn Ile Thr Ala Gln Leu Pro Thr Lys Gly Lys Ser Phe Pro Gly
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aca cag aat ttc cac ttg gag gtt ggc ctc att att ctc tct gta gtg      499
Thr Gln Asn Phe His Leu Glu Val Gly Leu Ile Ile Leu Ser Val Val
                120                 125                 130

ttc gca gta tgt ctt tta gcc tgc ctg ctg gga gtt gct ctc cga aaa      547
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ggc act atc gaa ggg ctc atc acc acc aat gtt gga gac agc act tta      643
Gly Thr Ile Glu Gly Leu Ile Thr Thr Asn Val Gly Asp Ser Thr Leu
165                 170         ·           175                 180

gca gat tta ttg gat cat tcg tgt aca tca gga agt ggc tct ggt ctt      691
Ala Asp Leu Leu Asp His Ser Cys Thr Ser Gly Ser Gly Ser Gly Leu
                185                 190                 195

cct ttt ctg gta caa aga aca gtg gct cgc cag att aca ctg ttg gag      739
Pro Phe Leu Val Gln Arg Thr Val Ala Arg Gln Ile Thr Leu Leu Glu
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tgt gtc ggg aaa ggc agg tat ggt gag gtg tgg agg ggc agc tgg caa      787
Cys Val Gly Lys Gly Arg Tyr Gly Glu Val Trp Arg Gly Ser Trp Gln
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ggg gaa aat gtt gcc gtg aag atc ttc tcc tcc cgt gat gag aag tca      835
Gly Glu Asn Val Ala Val Lys Ile Phe Ser Ser Arg Asp Glu Lys Ser
    230                 235                 240

tgg ttc agg gaa acg gaa ttg tac aac act gtg atg ctg agg cat gaa      883
Trp Phe Arg Glu Thr Glu Leu Tyr Asn Thr Val Met Leu Arg His Glu
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aat atc tta ggt ttc att gct tca gac atg aca tca aga cac tcc agt      931
Asn Ile Leu Gly Phe Ile Ala Ser Asp Met Thr Ser Arg His Ser Ser
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acc cag ctg tgg tta att aca cat tat cat gaa atg gga tcg ttg tac      979
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gac tat ctt cag ctt act act ctg gat aca gtt agc tgc ctt cga ata     1027
Asp Tyr Leu Gln Leu Thr Thr Leu Asp Thr Val Ser Cys Leu Arg Ile
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gtg ctg tcc ata gct agt ggt ctt gca cat ttg cac ata gag ata ttt     1075
Val Leu Ser Ile Ala Ser Gly Leu Ala His Leu His Ile Glu Ile Phe
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Gly Thr Gln Gly Lys Pro Ala Ile Ala His Arg Asp Leu Lys Ser Lys
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aat att ctg gtt aag aag aat gga cag tgt tgc ata gca gat ttg ggc     1171
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ctg gca gtc atg cat tcc cag agc acc aat cag ctt gat gtg ggg aac     1219
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aat ccc cgt gtg ggc acc aag cgc tac atg gcc ccc gaa gtt cta gat     1267
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Gln Arg Pro Asn Ile Pro Asn Arg Trp Phe Ser Asp Pro Thr Leu Thr
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Ser Leu Ala Lys Leu Met Lys Glu Cys Trp Tyr Gln Asn Pro Ser Ala
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Arg Leu Thr Ala Leu Arg Ile Lys Lys Thr Leu Thr Lys Ile Asp Asn
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Cys Lys Thr Pro Pro Ser Pro Gly Gln Ala Val Glu Cys Cys Gln Gly
            85   90   95

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            100   105   110

Ser Phe Pro Gly Thr Gln Asn Phe His Leu Glu Val Gly Leu Ile Ile
        115   120   125

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Asp Ser Thr Leu Ala Asp Leu Leu Asp His Ser Cys Thr Ser Gly Ser
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Arg His Ser Ser Thr Gln Leu Trp Leu Ile Thr His Tyr His Glu Met

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Leu Lys Ser Lys Asn Ile Leu Val Lys Lys Asn Gly Gln Cys Cys Ile
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Ala Asp Leu Gly Leu Ala Val Met His Ser Gln Ser Thr Asn Gln Leu
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Asp Val Gly Asn Asn Pro Arg Val Gly Thr Lys Arg Tyr Met Ala Pro
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Arg Val Asp Ile Trp Ala Phe Gly Leu Val Leu Trp Glu Val Ala Arg
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Arg Met Val Ser Asn Gly Ile Val Glu Asp Tyr Lys Pro Pro Phe Tyr
            420                    425                    430
Asp Val Val Pro Asn Asp Pro Ser Phe Glu Asp Met Arg Lys Val Val
            435                    440                    445
Cys Val Asp Gln Gln Arg Pro Asn Ile Pro Asn Arg Trp Phe Ser Asp
    450                    455                    460
Pro Thr Leu Thr Ser Leu Ala Lys Leu Met Lys Glu Cys Trp Tyr Gln
465                    470                    475                    480
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Leu Phe Ile Ile Ser Arg Val Gln Gly Gln Asn Leu Asp Ser Met Leu
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gga gta acc tta gca cca gag gat acc ttg cct ttt tta aag tgc tat     495
Gly Val Thr Leu Ala Pro Glu Asp Thr Leu Pro Phe Leu Lys Cys Tyr
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95                  100                 105                 110

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Ile Gly Pro Phe Phe Asp Gly Ser Ile Arg Trp Leu Val Leu Leu Ile
             145                 150                 155

tct atg gct gtc tgc ata att gct atg atc atc ttc tcc agc tgc ttt     831
Ser Met Ala Val Cys Ile Ile Ala Met Ile Ile Phe Ser Ser Cys Phe
    160                 165                 170

tgt tac aaa cat tat tgc aag agc atc tca agc aga cgt cgt tac aat     879
Cys Tyr Lys His Tyr Cys Lys Ser Ile Ser Ser Arg Arg Arg Tyr Asn
175                 180                 185                 190

cgt gat ttg gaa cag gat gaa gca ttt att cca gtt gga gaa tca cta     927
Arg Asp Leu Glu Gln Asp Glu Ala Phe Ile Pro Val Gly Glu Ser Leu
                 195                 200                 205

aaa gac ctt att gac cag tca caa agt tct ggt agt ggg tct gga cta     975
Lys Asp Leu Ile Asp Gln Ser Gln Ser Ser Gly Ser Gly Ser Gly Leu
             210                 215                 220

cct tta ttg gtt cag cga act att gcc aaa cag att cag atg gtc cgg    1023
Pro Leu Leu Val Gln Arg Thr Ile Ala Lys Gln Ile Gln Met Val Arg
             225                 230                 235

caa gtt ggt aaa ggc cga tat gga gaa gta tgg atg ggc aaa tgg cgt    1071
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Gln Val Gly Lys Gly Arg Tyr Gly Glu Val Trp Met Gly Lys Trp Arg
    240                 245             250

ggc gaa aaa gtg gcg gtg aaa gta ttc ttt acc act gaa gaa gcc agc    1119
Gly Glu Lys Val Ala Val Lys Val Phe Phe Thr Thr Glu Glu Ala Ser
255                 260             265             270

tgg ttt cga gaa aca gaa atc tac caa act gtg cta atg cgc cat gaa    1167
Trp Phe Arg Glu Thr Glu Ile Tyr Gln Thr Val Leu Met Arg His Glu
                275             280             285

aac ata ctt ggt ttc ata gcg gca gac att aaa ggt aca ggt tcc tgg    1215
Asn Ile Leu Gly Phe Ile Ala Ala Asp Ile Lys Gly Thr Gly Ser Trp
                290             295             300

act cag ctc tat ttg att act gat tac cat gaa aat gga tct ctc tat    1263
Thr Gln Leu Tyr Leu Ile Thr Asp Tyr His Glu Asn Gly Ser Leu Tyr
                305             310             315

gac ttc ctg aaa tgt gct aca ctg gac acc aga gcc ctg ctt aaa ttg    1311
Asp Phe Leu Lys Cys Ala Thr Leu Asp Thr Arg Ala Leu Leu Lys Leu
                320             325             330

gct tat tca gct gcc tgt ggt ctg tgc cac ctg cac aca gaa att tat    1359
Ala Tyr Ser Ala Ala Cys Gly Leu Cys His Leu His Thr Glu Ile Tyr
335                 340             345             350

ggc acc caa gga aag ccc gca att gct cat cga gac cta aag agc aaa    1407
Gly Thr Gln Gly Lys Pro Ala Ile Ala His Arg Asp Leu Lys Ser Lys
                355             360             365

aac atc ctc atc aag aaa aat ggg agt tgc tgc att gct gac ctg ggc    1455
Asn Ile Leu Ile Lys Lys Asn Gly Ser Cys Cys Ile Ala Asp Leu Gly
                370             375             380

ctt gct gtt aaa ttc aac agt gac aca aat gaa gtt gat gtg ccc ttg    1503
Leu Ala Val Lys Phe Asn Ser Asp Thr Asn Glu Val Asp Val Pro Leu
                385             390             395

aat acc agg gtg ggc acc aaa cgc tac atg gct ccc gaa gtg ctg gac    1551
Asn Thr Arg Val Gly Thr Lys Arg Tyr Met Ala Pro Glu Val Leu Asp
400                 405             410

gaa agc ctg aac aaa aac cac ttc cag ccc tac atc atg gct gac atc    1599
Glu Ser Leu Asn Lys Asn His Phe Gln Pro Tyr Ile Met Ala Asp Ile
415                 420             425             430

tac agc ttc ggc cta atc att tgg gag atg gct cgt cgt tgt atc aca    1647
Tyr Ser Phe Gly Leu Ile Ile Trp Glu Met Ala Arg Arg Cys Ile Thr
                435             440             445

gga ggg atc gtg gaa gaa tac caa ttg cca tat tac aac atg gta ccg    1695
Gly Gly Ile Val Glu Glu Tyr Gln Leu Pro Tyr Tyr Asn Met Val Pro
                450             455             460

agt gat ccg tca tac gaa gat atg cgt gag gtt gtg tgt gtc aaa cgt    1743
Ser Asp Pro Ser Tyr Glu Asp Met Arg Glu Val Val Cys Val Lys Arg
            465             470             475

ttg cgg cca att gtg tct aat cgg tgg aac agt gat gaa tgt cta cga    1791
Leu Arg Pro Ile Val Ser Asn Arg Trp Asn Ser Asp Glu Cys Leu Arg
    480             485             490
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gca gtt ttg aag cta atg tca gaa tgc tgg gcc cac aat cca gcc tcc    1839
Ala Val Leu Lys Leu Met Ser Glu Cys Trp Ala His Asn Pro Ala Ser
495             500             505             510

aga ctc aca gca ttg aga att aag aag acg ctt gcc aag atg gtt gaa    1887
Arg Leu Thr Ala Leu Arg Ile Lys Lys Thr Leu Ala Lys Met Val Glu
            515             520             525

tcc caa gat gta aaa atc tga tggttaaacc atcggaggag aaactctaga       1938
Ser Gln Asp Val Lys Ile
            530

ctgcaagaac tgtttttacc catggcatgg gtggaattag agtggaataa ggatgttaac  1998

ttggttctca gactctttct tcactacgtg ttcacaggct gctaatatta aacctttcag  2058

tactcttatt aggatacaag ctgggaactt ctaaacactt cattctttat atatggacag  2118

ctttatttta aatgtggttt ttgatgcctt tttttaagtg ggttttatg aactgcatca   2178

agacttcaat cctgattagt gtctccagtc aagctctggg tactgaattg cctgttcata  2238

aaacggtgct ttctgtgaaa gccttaagaa gataaatgag cgcagcagag atggagaaat  2298

agactttgcc ttttacctga gacattcagt tcgtttgtat ctacctttg taaaacagcc   2358

tatagatgat gatgtgtttg ggatactgct tattttatga tagtttgtcc tgtgtcctta  2418

gtgatgtgtg tgtgtctcca tgcacatgca cgccgggatt cctctgctgc catttgaatt  2478

agaagaaaat aatttatatg catgcacagg aagatattgg tggccggtgg ttttgtgctt  2538

taaaaatgca atatctgacc aagattcgcc aatctcatac aagccattta ctttgcaagt  2598

gagatagctt ccccaccagc tttatttttt aacatgaaag ctgatgccaa ggccaaaaga  2658

agtttaaagc atctgtaaat ttggactgtt ttccttcaac caccattttt tttgtggtta  2718

ttattttgt cacggaaagc atcctctcca aagttggagc ttctattgcc atgaaccatg    2778

cttacaaaga aagcacttct tattgaagtg aattcctgca tttgatagca atgtaagtgc  2838

ctataaccat gttctatatt ctttattctc agtaactttt aaaagggaag ttatttatat  2898

tttgtgtata atgtgcttta tttgcaaatc accc                             2932

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<213>  Homo sapiens

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Met Thr Gln Leu Tyr Ile Tyr Ile Arg Leu Leu Gly Ala Tyr Leu Phe
1               5               10              15

Ile Ile Ser Arg Val Gln Gly Gln Asn Leu Asp Ser Met Leu His Gly
            20              25              30

Thr Gly Met Lys Ser Asp Ser Asp Gln Lys Lys Ser Glu Asn Gly Val
            35              40              45

Thr Leu Ala Pro Glu Asp Thr Leu Pro Phe Leu Lys Cys Tyr Cys Ser
        50              55              60
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Gly His Cys Pro Asp Asp Ala Ile Asn Asn Thr Cys Ile Thr Asn Gly
65              70              75              80

His Cys Phe Ala Ile Ile Glu Glu Asp Asp Gln Gly Glu Thr Thr Leu
            85              90              95

Ala Ser Gly Cys Met Lys Tyr Glu Gly Ser Asp Phe Gln Cys Lys Asp
            100             105             110

Ser Pro Lys Ala Gln Leu Arg Arg Thr Ile Glu Cys Cys Arg Thr Asn
        115             120             125

Leu Cys Asn Gln Tyr Leu Gln Pro Thr Leu Pro Pro Val Val Ile Gly
    130             135             140

Pro Phe Phe Asp Gly Ser Ile Arg Trp Leu Val Leu Leu Ile Ser Met
145             150             155             160

Ala Val Cys Ile Ile Ala Met Ile Ile Phe Ser Ser Cys Phe Cys Tyr
            165             170             175

Lys His Tyr Cys Lys Ser Ile Ser Ser Arg Arg Arg Tyr Asn Arg Asp
        180             185             190

Leu Glu Gln Asp Glu Ala Phe Ile Pro Val Gly Glu Ser Leu Lys Asp
        195             200             205

Leu Ile Asp Gln Ser Gln Ser Ser Gly Ser Gly Ser Gly Leu Pro Leu
    210             215             220

Leu Val Gln Arg Thr Ile Ala Lys Gln Ile Gln Met Val Arg Gln Val
225             230             235             240

Gly Lys Gly Arg Tyr Gly Glu Val Trp Met Gly Lys Trp Arg Gly Glu
            245             250             255

Lys Val Ala Val Lys Val Phe Phe Thr Thr Glu Glu Ala Ser Trp Phe
        260             265             270

Arg Glu Thr Glu Ile Tyr Gln Thr Val Leu Met Arg His Glu Asn Ile
        275             280             285

Leu Gly Phe Ile Ala Ala Asp Ile Lys Gly Thr Gly Ser Trp Thr Gln
    290             295             300

Leu Tyr Leu Ile Thr Asp Tyr His Glu Asn Gly Ser Leu Tyr Asp Phe
305             310             315             320

Leu Lys Cys Ala Thr Leu Asp Thr Arg Ala Leu Leu Lys Leu Ala Tyr
            325             330             335

Ser Ala Ala Cys Gly Leu Cys His Leu His Thr Glu Ile Tyr Gly Thr
            340             345             350

Gln Gly Lys Pro Ala Ile Ala His Arg Asp Leu Lys Ser Lys Asn Ile
        355             360             365

Leu Ile Lys Lys Asn Gly Ser Cys Cys Ile Ala Asp Leu Gly Leu Ala
    370             375             380

Val Lys Phe Asn Ser Asp Thr Asn Glu Val Asp Val Pro Leu Asn Thr
385             390             395             400
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Arg Val Gly Thr Lys Arg Tyr Met Ala Pro Glu Val Leu Asp Glu Ser
            405             410             415

Leu Asn Lys Asn His Phe Gln Pro Tyr Ile Met Ala Asp Ile Tyr Ser
            420             425             430

Phe Gly Leu Ile Ile Trp Glu Met Ala Arg Arg Cys Ile Thr Gly Gly
        435             440             445

Ile Val Glu Glu Tyr Gln Leu Pro Tyr Tyr Asn Met Val Pro Ser Asp
    450             455             460

Pro Ser Tyr Glu Asp Met Arg Glu Val Val Cys Val Lys Arg Leu Arg
465             470             475             480

Pro Ile Val Ser Asn Arg Trp Asn Ser Asp Glu Cys Leu Arg Ala Val
            485             490             495

Leu Lys Leu Met Ser Glu Cys Trp Ala His Asn Pro Ala Ser Arg Leu
        500             505             510

Thr Ala Leu Arg Ile Lys Lys Thr Leu Ala Lys Met Val Glu Ser Gln
        515             520             525

Asp Val Lys Ile
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<213>    Homo sapiens

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<222>    (187)..(1695)
<223>

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tgggaagcgg cggcgggtta acttcggctg aatcacaacc atttggcgct gagctatgac     120

aagagagcaa acaaaaagtt aaaggagcaa cccggccata agtgaagaga gaagtttatt     180

gataac atg ctc tta cga agc tct gga aaa tta aat gtg ggc acc aag        228
        Met Leu Leu Arg Ser Ser Gly Lys Leu Asn Val Gly Thr Lys
        1               5                   10

aag gag gat gga gag agt aca gcc ccc acc cct cgg ccc aag atc cta      276
Lys Glu Asp Gly Glu Ser Thr Ala Pro Thr Pro Arg Pro Lys Ile Leu
15                  20                  25                  30

cgt tgt aaa tgc cac cac cac tgt ccg gaa gac tca gtc aac aat atc      324
Arg Cys Lys Cys His His His Cys Pro Glu Asp Ser Val Asn Asn Ile
                35                  40                  45

tgc agc aca gat ggg tac tgc ttc acg atg ata gaa gaa gat gac tct      372
Cys Ser Thr Asp Gly Tyr Cys Phe Thr Met Ile Glu Glu Asp Asp Ser
            50                  55                  60

gga atg cct gtt gtc acc tct gga tgt cta gga cta gaa ggg tca gat      420
Gly Met Pro Val Val Thr Ser Gly Cys Leu Gly Leu Glu Gly Ser Asp
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ttt caa tgt cgt gac act ccc att cct cat caa aga aga tca att gaa        468
Phe Gln Cys Arg Asp Thr Pro Ile Pro His Gln Arg Arg Ser Ile Glu
    80                  85                  90

tgc tgc aca gaa agg aat gag tgt aat aaa gac ctc cac ccc act ctg        516
Cys Cys Thr Glu Arg Asn Glu Cys Asn Lys Asp Leu His Pro Thr Leu
95                  100                 105                 110

cct cct ctc aag gac aga gat ttt gtt gat ggg ccc ata cac cac aag        564
Pro Pro Leu Lys Asp Arg Asp Phe Val Asp Gly Pro Ile His His Lys
                115                 120                 125

gcc ttg ctt atc tct gtg act gtc tgt agt tta ctc ttg gtc ctc att        612
Ala Leu Leu Ile Ser Val Thr Val Cys Ser Leu Leu Leu Val Leu Ile
            130                 135                 140

att tta ttc tgt tac ttc agg tat aaa aga caa gaa gcc cga cct cgg        660
Ile Leu Phe Cys Tyr Phe Arg Tyr Lys Arg Gln Glu Ala Arg Pro Arg
        145                 150                 155

tac agc att ggg ctg gag cag gac gag aca tac att cct cct gga gag        708
Tyr Ser Ile Gly Leu Glu Gln Asp Glu Thr Tyr Ile Pro Pro Gly Glu
    160                 165                 170

tcc ctg aga gac ttg atc gag cag tct cag agc tcg gga agt gga tca        756
Ser Leu Arg Asp Leu Ile Glu Gln Ser Gln Ser Ser Gly Ser Gly Ser
175                 180                 185                 190

ggc ctc cct ctg ctg gtc caa agg aca ata gct aag caa att cag atg        804
Gly Leu Pro Leu Leu Val Gln Arg Thr Ile Ala Lys Gln Ile Gln Met
                195                 200                 205

gtg aag cag att gga aaa ggc cgc tat ggc gag gtg tgg atg gga aag        852
Val Lys Gln Ile Gly Lys Gly Arg Tyr Gly Glu Val Trp Met Gly Lys
            210                 215                 220

tgg cgt gga gaa aag gtg gct gtg aaa gtg ttc ttc acc acg gag gaa        900
Trp Arg Gly Glu Lys Val Ala Val Lys Val Phe Phe Thr Thr Glu Glu
        225                 230                 235

gcc agc tgg ttc cga gag act gag ata tat cag acg gtc ctg atg cgg        948
Ala Ser Trp Phe Arg Glu Thr Glu Ile Tyr Gln Thr Val Leu Met Arg
    240                 245                 250

cat gag aat att ctg ggg ttc att gct gca gat atc aaa ggg act ggg        996
His Glu Asn Ile Leu Gly Phe Ile Ala Ala Asp Ile Lys Gly Thr Gly
255                 260                 265                 270

tcc tgg act cag ttg tac ctc atc aca gac tat cat gaa aac ggc tcc       1044
Ser Trp Thr Gln Leu Tyr Leu Ile Thr Asp Tyr His Glu Asn Gly Ser
                275                 280                 285

ctt tat gac tat ctg aaa tcc acc acc tta gac gca aag tcc atg ctg       1092
Leu Tyr Asp Tyr Leu Lys Ser Thr Thr Leu Asp Ala Lys Ser Met Leu
                290                 295                 300

aag cta gcc tac tcc tct gtc agc ggc cta tgc cat tta cac acg gaa       1140
Lys Leu Ala Tyr Ser Ser Val Ser Gly Leu Cys His Leu His Thr Glu
        305                 310                 315

atc ttt agc act caa ggc aag cca gca atc gcc cat cga gac ttg aaa       1188
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Ile Phe Ser Thr Gln Gly Lys Pro Ala Ile Ala His Arg Asp Leu Lys
    320             325             330

agt aaa aac atc ctg gtg aag aaa aat gga act tgc tgc ata gca gac     1236
Ser Lys Asn Ile Leu Val Lys Lys Asn Gly Thr Cys Cys Ile Ala Asp
335             340             345             350

ctg ggc ttg gct gtc aag ttc att agt gac aca aat gag gtt gac atc     1284
Leu Gly Leu Ala Val Lys Phe Ile Ser Asp Thr Asn Glu Val Asp Ile
            355             360             365

cca ccc aac acc cgg gtt ggc acc aag cgc tat atg cct cca gaa gtg     1332
Pro Pro Asn Thr Arg Val Gly Thr Lys Arg Tyr Met Pro Pro Glu Val
            370             375             380

ctg gac gag agc ttg aat aga aac cat ttc cag tcc tac att atg gct     1380
Leu Asp Glu Ser Leu Asn Arg Asn His Phe Gln Ser Tyr Ile Met Ala
            385             390             395

gac atg tac agc ttt gga ctc atc ctc tgg gag att gca agg aga tgt     1428
Asp Met Tyr Ser Phe Gly Leu Ile Leu Trp Glu Ile Ala Arg Arg Cys
        400             405             410

gtt tct gga ggt ata gtg gaa gaa tac cag ctt ccc tat cac gac ctg     1476
Val Ser Gly Gly Ile Val Glu Glu Tyr Gln Leu Pro Tyr His Asp Leu
415             420             425             430

gtg ccc agt gac cct tct tat gag gac atg aga gaa att gtg tgc atg     1524
Val Pro Ser Asp Pro Ser Tyr Glu Asp Met Arg Glu Ile Val Cys Met
            435             440             445

aag aag tta cgg cct tca ttc ccc aat cga tgg agc agt gat gag tgt     1572
Lys Lys Leu Arg Pro Ser Phe Pro Asn Arg Trp Ser Ser Asp Glu Cys
            450             455             460

ctc agg cag atg ggg aag ctt atg aca gag tgc tgg gcg cag aat cct     1620
Leu Arg Gln Met Gly Lys Leu Met Thr Glu Cys Trp Ala Gln Asn Pro
        465             470             475

gcc tcc agg ctg acg gcc ctg aga gtt aag aaa acc ctt gcc aaa atg     1668
Ala Ser Arg Leu Thr Ala Leu Arg Val Lys Lys Thr Leu Ala Lys Met
        480             485             490

tca gag tcc cag gac att aaa ctc tga cgtcagatac ttgtggacag           1715
Ser Glu Ser Gln Asp Ile Lys Leu
495             500

agcaagaatt tcacagaagc atcgttagcc caagccttga acgttagcct actgcccagt   1775

gagttcagac tttcctggaa gagagcacgg tgggcagaca cagaggaacc cagaaacacg   1835

gattcatcat ggctttctga ggaggagaaa ctgtttgggt aacttgttca agatatgatg   1895

catgttgctt tctaagaaag ccctgtattt tgaattacca tttttttata aaaaaaa      1952

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Met Leu Leu Arg Ser Ser Gly Lys Leu Asn Val Gly Thr Lys Lys Glu
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Asp Gly Glu Ser Thr Ala Pro Thr Pro Arg Pro Lys Ile Leu Arg Cys
        20                  25                  30

Lys Cys His His His Cys Pro Glu Asp Ser Val Asn Asn Ile Cys Ser
        35                  40                  45

Thr Asp Gly Tyr Cys Phe Thr Met Ile Glu Glu Asp Asp Ser Gly Met
    50                  55                  60

Pro Val Val Thr Ser Gly Cys Leu Gly Leu Glu Gly Ser Asp Phe Gln
65                  70                  75                      80

Cys Arg Asp Thr Pro Ile Pro His Gln Arg Arg Ser Ile Glu Cys Cys
                85                  90                  95

Thr Glu Arg Asn Glu Cys Asn Lys Asp Leu His Pro Thr Leu Pro Pro
            100                 105                 110

Leu Lys Asp Arg Asp Phe Val Asp Gly Pro Ile His His Lys Ala Leu
        115                 120                 125

Leu Ile Ser Val Thr Val Cys Ser Leu Leu Leu Val Leu Ile Ile Leu
    130                 135                 140

Phe Cys Tyr Phe Arg Tyr Lys Arg Gln Glu Ala Arg Pro Arg Tyr Ser
145                 150                 155                 160

Ile Gly Leu Glu Gln Asp Glu Thr Tyr Ile Pro Pro Gly Glu Ser Leu
            165                 170                 175

Arg Asp Leu Ile Glu Gln Ser Gln Ser Ser Gly Ser Gly Ser Gly Leu
        180                 185                 190

Pro Leu Leu Val Gln Arg Thr Ile Ala Lys Gln Ile Gln Met Val Lys
    195                 200                 205

Gln Ile Gly Lys Gly Arg Tyr Gly Glu Val Trp Met Gly Lys Trp Arg
    210                 215                 220

Gly Glu Lys Val Ala Val Lys Val Phe Phe Thr Thr Glu Glu Ala Ser
225                 230                 235                 240

Trp Phe Arg Glu Thr Glu Ile Tyr Gln Thr Val Leu Met Arg His Glu
            245                 250                 255

Asn Ile Leu Gly Phe Ile Ala Ala Asp Ile Lys Gly Thr Gly Ser Trp
            260                 265                 270

Thr Gln Leu Tyr Leu Ile Thr Asp Tyr His Glu Asn Gly Ser Leu Tyr
        275                 280                 285

Asp Tyr Leu Lys Ser Thr Thr Leu Asp Ala Lys Ser Met Leu Lys Leu
    290                 295                 300

Ala Tyr Ser Ser Val Ser Gly Leu Cys His Leu His Thr Glu Ile Phe
305                 310                 315                 320

Ser Thr Gln Gly Lys Pro Ala Ile Ala His Arg Asp Leu Lys Ser Lys
            325                 330                 335

Asn Ile Leu Val Lys Lys Asn Gly Thr Cys Cys Ile Ala Asp Leu Gly
        340                 345                 350
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Leu Ala Val Lys Phe Ile Ser Asp Thr Asn Glu Val Asp Ile Pro Pro
        355                 360                 365

Asn Thr Arg Val Gly Thr Lys Arg Tyr Met Pro Pro Glu Val Leu Asp
        370                 375                 380

Glu Ser Leu Asn Arg Asn His Phe Gln Ser Tyr Ile Met Ala Asp Met
385                     390                 395                 400

Tyr Ser Phe Gly Leu Ile Leu Trp Glu Ile Ala Arg Arg Cys Val Ser
                405                 410                 415

Gly Gly Ile Val Glu Glu Tyr Gln Leu Pro Tyr His Asp Leu Val Pro
            420                 425                 430

Ser Asp Pro Ser Tyr Glu Asp Met Arg Glu Ile Val Cys Met Lys Lys
        435                 440                 445

Leu Arg Pro Ser Phe Pro Asn Arg Trp Ser Ser Asp Glu Cys Leu Arg
        450                 455                 460

Gln Met Gly Lys Leu Met Thr Glu Cys Trp Ala Gln Asn Pro Ala Ser
465                     470                 475                 480

Arg Leu Thr Ala Leu Arg Val Lys Lys Thr Leu Ala Lys Met Ser Glu
                485                 490                 495

Ser Gln Asp Ile Lys Leu
            500


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<213>  Homo sapiens

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<222>  (49)..(1341)
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                                                     Met His Val
                                                     1

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Arg Ser Leu Arg Ala Ala Ala Pro His Ser Phe Val Ala Leu Trp Ala
    5                   10                  15

ccc ctg ttc ctg ctg cgc tcc gcc ctg gcc gac ttc agc ctg gac aac     153
Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser Leu Asp Asn
20                  25                  30                  35

gag gtg cac tcg agc ttc atc cac cgg cgc ctc cgc agc cag gag cgg     201
Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser Gln Glu Arg
                40                  45                  50

cgg gag atg cag cgc gag atc ctc tcc att ttg ggc ttg ccc cac cgc     249
Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu Pro His Arg
            55                  60                  65

ccg cgc ccg cac ctc cag ggc aag cac aac tcg gca ccc atg ttc atg     297
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```
            Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro Met Phe Met
                70                  75                  80

ctg gac ctg tac aac gcc atg gcg gtg gag gag ggc ggc ggg ccc ggc        345
Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Gly Gly Gly Pro Gly
    85                  90                  95

ggc cag ggc ttc tcc tac ccc tac aag gcc gtc ttc agt acc cag ggc        393
Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser Thr Gln Gly
100                 105                 110                 115

ccc cct ctg gcc agc ctg caa gat agc cat ttc ctc acc gac gcc gac        441
Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr Asp Ala Asp
                120                 125                 130

atg gtc atg agc ttc gtc aac ctc gtg gaa cat gac aag gaa ttc ttc        489
Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys Glu Phe Phe
                135                 140                 145

cac cca cgc tac cac cat cga gag ttc cgg ttt gat ctt tcc aag atc        537
His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu Ser Lys Ile
                150                 155                 160

cca gaa ggg gaa gct gtc acg gca gcc gaa ttc cgg atc tac aag gac        585
Pro Glu Gly Glu Ala Val Thr Ala Ala Glu Phe Arg Ile Tyr Lys Asp
    165                 170                 175

tac atc cgg gaa cgc ttc gac aat gag acg ttc cgg atc agc gtt tat        633
Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Arg Ile Ser Val Tyr
180                 185                 190                 195

cag gtg ctc cag gag cac ttg ggc agg gaa tcg gat ctc ttc ctg ctc        681
Gln Val Leu Gln Glu His Leu Gly Arg Glu Ser Asp Leu Phe Leu Leu
                200                 205                 210

gac agc cgt acc ctc tgg gcc tcg gag gag ggc tgg ctg gtg ttt gac        729
Asp Ser Arg Thr Leu Trp Ala Ser Glu Glu Gly Trp Leu Val Phe Asp
                215                 220                 225

atc aca gcc acc agc aac cac tgg gtg gtc aat ccg cgg cac aac ctg        777
Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg His Asn Leu
                230                 235                 240

ggc ctg cag ctc tcg gtg gag acg ctg gat ggg cag agc atc aac ccc        825
Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser Ile Asn Pro
    245                 250                 255

aag ttg gcg ggc ctg att ggg cgg cac ggg ccc cag aac aag cag ccc        873
Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn Lys Gln Pro
260                 265                 270                 275

ttc atg gtg gct ttc ttc aag gcc acg gag gtc cac ttc cgc agc atc        921
Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Phe Arg Ser Ile
                280                 285                 290

cgg tcc acg ggg agc aaa cag cgc agc cag aac cgc tcc aag acg ccc        969
Arg Ser Thr Gly Ser Lys Gln Arg Ser Gln Asn Arg Ser Lys Thr Pro
                295                 300                 305

aag aac cag gaa gcc ctg cgg atg gcc aac gtg gca gag aac agc agc       1017
Lys Asn Gln Glu Ala Leu Arg Met Ala Asn Val Ala Glu Asn Ser Ser
                310                 315                 320
```

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agc gac cag agg cag gcc tgt aag aag cac gag ctg tat gtc agc ttc    1065
Ser Asp Gln Arg Gln Ala Cys Lys Lys His Glu Leu Tyr Val Ser Phe
    325             330             335

cga gac ctg ggc tgg cag gac tgg atc atc gcg cct gaa ggc tac gcc    1113
Arg Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala Pro Glu Gly Tyr Ala
340             345             350             355

gcc tac tac tgt gag ggg gag tgt gcc ttc cct ctg aac tcc tac atg    1161
Ala Tyr Tyr Cys Glu Gly Glu Cys Ala Phe Pro Leu Asn Ser Tyr Met
            360             365             370

aac gcc acc aac cac gcc atc gtg cag acg ctg gtc cac ttc atc aac    1209
Asn Ala Thr Asn His Ala Ile Val Gln Thr Leu Val His Phe Ile Asn
        375             380             385

ccg gaa acg gtg ccc aag ccc tgc tgt gcg ccc acg cag ctc aat gcc    1257
Pro Glu Thr Val Pro Lys Pro Cys Cys Ala Pro Thr Gln Leu Asn Ala
        390             395             400

atc tcc gtc ctc tac ttc gat gac agc tcc aac gtc atc ctg aag aaa    1305
Ile Ser Val Leu Tyr Phe Asp Asp Ser Ser Asn Val Ile Leu Lys Lys
    405             410             415

tac aga aac atg gtg gtc cgg gcc tgt ggc tgc cac tagctcctcc        1351
Tyr Arg Asn Met Val Val Arg Ala Cys Gly Cys His
420             425             430

gagaattcag accctttggg gccaagtttt tctggatcct ccattgctcg ccttggccag    1411

gaaccagcag accaactgcc ttttgtgaga ccttcccctc cctatcccca actttaaagg    1471

tgtgagagta ttaggaaaca tgagcagcat atggcttttg atcagttttt cagtggcagc    1531

atccaatgaa caagatccta caagctgtgc aggcaaaacc tagcaggaaa aaaaaacaac    1591

gcataaagaa aaatggccgg gccaggtcat tggctgggaa gtctcagcca tgcacggact    1651

cgtttccaga ggtaattatg agcgcctacc agccaggcca cccagccgtg ggaggaaggg    1711

ggcgtggcaa ggggtgggca cattggtgtc tgtgcgaaag gaaaattgac ccggaagttc    1771

ctgtaataaa tgtcacaata aaacgaatga atgaaaaaaa aaaaaaaaaa a           1822
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<213>   Homo sapiens

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Met His Val Arg Ser Leu Arg Ala Ala Ala Pro His Ser Phe Val Ala
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Leu Trp Ala Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser
            20              25              30

Leu Asp Asn Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser
        35              40              45

Gln Glu Arg Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu
    50              55              60
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Pro His Arg Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro
65              70              75                          80

Met Phe Met Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Gly Gly
                85              90                  95

Gly Pro Gly Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser
            100             105             110

Thr Gln Gly Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr
        115             120             125

Asp Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys
    130             135             140

Glu Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu
145             150             155             160

Ser Lys Ile Pro Glu Gly Glu Ala Val Thr Ala Ala Glu Phe Arg Ile
            165             170             175

Tyr Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Arg Ile
        180             185             190

Ser Val Tyr Gln Val Leu Gln Glu His Leu Gly Arg Glu Ser Asp Leu
        195             200             205

Phe Leu Leu Asp Ser Arg Thr Leu Trp Ala Ser Glu Glu Gly Trp Leu
    210             215             220

Val Phe Asp Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg
225             230             235             240

His Asn Leu Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser
            245             250             255

Ile Asn Pro Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn
            260             265             270

Lys Gln Pro Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Phe
        275             280             285

Arg Ser Ile Arg Ser Thr Gly Ser Lys Gln Arg Ser Gln Asn Arg Ser
    290             295             300

Lys Thr Pro Lys Asn Gln Glu Ala Leu Arg Met Ala Asn Val Ala Glu
305             310             315             320

Asn Ser Ser Ser Asp Gln Arg Gln Ala Cys Lys Lys His Glu Leu Tyr
            325             330             335

Val Ser Phe Arg Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala Pro Glu
        340             345             350

Gly Tyr Ala Ala Tyr Tyr Cys Glu Gly Glu Cys Ala Phe Pro Leu Asn
        355             360             365

Ser Tyr Met Asn Ala Thr Asn His Ala Ile Val Gln Thr Leu Val His
    370             375             380

Phe Ile Asn Pro Glu Thr Val Pro Lys Pro Cys Cys Ala Pro Thr Gln
385             390             395             400
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```
Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Ser Ser Asn Val Ile
                405                 410                 415

Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys Gly Cys His
            420                 425                 430
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Asp Trp Xaa Ile Ala Pro Xaa Gly Tyr Xaa Ala Tyr Tyr Cys Glu Gly
            20              25              30

Glu Cys Xaa Phe Pro Leu Xaa Ser Xaa Met Asn Ala Thr Asn His Ala
        35              40              45

Ile Xaa Gln Xaa Leu Val His Xaa Xaa Xaa Pro Xaa Xaa Val Pro Lys
    50              55              60

Xaa Cys Cys Ala Pro Thr Xaa Leu Xaa Ala Xaa Ser Val Leu Tyr Xaa
65              70              75                  80

Asp Xaa Ser Xaa Asn Val Xaa Leu Xaa Lys Xaa Arg Asn Met Val Val
            85              90                  95

Xaa Ala Cys Gly Cys His
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cggaattctg gtgccatata                                             20
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